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ABSTRACT

Periodic summaries of research techniques used in important journals help professors of educational research teach each new generation of researchers. Literature published in "American Educational Research Journal" (AERJ), "Educational Researcher" (ER), and "Review of Educational Research (RER) is reviewed for the 10-year period ending in 1987. This kind of research technique has appeared frequently in educational literature. Periodic updates of recent literature with respect to methods used has an extensive history. A description of the methodology focuses on the coding process (reading each article to identify every research method or statistical technique used and categorizing all methods and techniques identified in each article) and the categories employed to code research methods or statistical techniques used (descriptive, bivariate correlation, t-test, nonparametric, meta analysis, ANOVA/ANCOVA, psychometric theory, multiple correlation/regression, multivariate, factor/cluster, LISREL, Bayesian, simulation, modeling, and qualitative). The results of this study show the most frequent methods used in rank order for JEP are ANOVA/ANCOVA, bivariate correlation, t-test, multiple regression, multivariate, and nonparametric techniques and for AERJ are ANOVA/ANCOVA, multiple regression, bivariate correlation, descriptive, multivariate, nonparametric, and t-test. For the three journals combined, five of the seven most frequently utilized methods are taught in most two-course statistics sequences required for doctoral study; only multivariate and nonparametric techniques are not covered comprehensively. Thus, it appears that graduate students are well-prepared and trained. Contains 11 references. Tables are included. (SM)

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Research Methods Employed in American Educational Research Journal, Educational Researcher, and Review of Educational Research from 1978 to 1987

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Research Methods Employed in American Educational Research Journal, Educational Researcher, and Review of Educational Research from 1978 to 1987

Professors of educational research have the task of teaching each new generation of researchers. In this role they frequently must make difficult decisions about which topics to cover in the limited amount of time available to them during a 3- or 4-semester-hour course. Since they are expected to provide students with enough expertise to be intelligent consumers of research (at the master's level) or to be researchers (at the doctoral level), the choice of topics to cover becomes critical. Unfortunately, it is not possible for every instructor of research methods to read all of the literature that will be encountered by students in their roles as consumers and developers of research. It is thus helpful for them if periodic summaries of research techniques used in important journals be provided. It is the purpose of this paper to review the literature published in American Educational Research Journal (AERJ), Educational Researcher (ER), and Review of Educational Research (RER) for the ten-year period ending in 1987.

Such a review of research techniques has appeared frequently in the educational literature. For example, Shaver and Norton (1980) examined the extent to which articles published in AERJ exemplified the canons of randomness and replication revered by methodologists. Willson (1980) surveyed the research techniques in AERJ from 1969 to 1978, finding that such biology-based techniques as correlation, multiple regression, discriminant analysis, and multivariate analysis of variance accounted

for 41% of the techniques while agriculture methods such as ANOVA and ANCOVA accounted for 34%. Smith and Caulley (1981) evaluated the excellence of educational journals through the study of citations, concluding that "articles published in RER in 1972 and 1973 have had considerably greater impact on the educational literature than articles published in AERJ (p. 22). Also in 1981, Walberg, Vukosavich, and Tsai examined the structure of the journal literature in educational research by examining citations of articles appearing in nine "core" educational research journals. Dillon (1983) examined questions in educational research according to their usage, content, linguistic type, logical operations, and cognitive process. Gordon, Nucci, West, Hoerr, Uguroglu, Vukosavich, and Tsai (1984) used publication and citation frequencies in AERJ, Journal of Educational Psychology (JEP), educational psychology textbooks, and the Social Science Citation Index to examine the productivity of individual educational researchers. Goodwin and Goodwin (1985a) tabulated the statistical techniques used in JEP over a four-year period and found that most were taught in introductory and intermediate methods or statistics classes; the authors obtained similar results when they examined the statistical techniques used in AERJ over the same time period (Goodwin & Goodwin, 1985b).

From the foregoing summaries, it is clear that periodic updates of recent literature with respect to methods used has an extensive history, and also that no extensive review of important journals in educational research has been completed recently. It is the intent of this paper to

extend the tradition of reviewing research techniques in common use in the literature by reviewing the techniques used in AERJ, ER, and RER from 1978 to 1987.

Method

All articles appearing in AERJ, ER, and RER for the ten-year period from 1978 to 1987 were selected for this study. Book reviews were deleted from AERJ and ER; annual meeting notices and directories were deleted from ER; nothing was deleted from RER.

The coding process included two steps: (a) reading the article to identify every research method or statistical technique used, and (b) categorizing all the methods and techniques identified in each article. Where more than one method was employed in a single article, all methods were coded into appropriate categories; as a result, the total coded methods may exceed the total number of articles reviewed. The categories employed to code research methods or statistical techniques used in the articles were:

Descriptive: frequencies, percentages, measures of central tendency and variability;

Bivariate correlation: Pearson product-moment correlation coefficients or other coefficients used with two variables;

t-test: two-group comparison of means;

Nonparametric: statistics used with nominal or ordinal data;

Meta analysis: syntheses of research using any of the three techniques proposed to date by Glass, McGaw, and Smith (1981), Rosenthal and Rubin (1982), and Hedges and Olkin (1985);

ANOVA/ANCOVA: hypotheses tested for group differences;

Psychometric theory: application of statistics to the development of measuring instruments;

Multiple correlation/regression: methods used to relate more than one independent variable to a single continuous dependent variable;

Multivariate: techniques using more than one dependent variable;

Factor/cluster: correlational techniques employed to isolate subsets of related variables/observations;

LISREL: analysis of covariance structures using maximum likelihood estimation (e.g., path analysis, confirmatory factor analysis);

Bayesian: use of Bayesian statistical methods rather than Neyman-Pearson;

Simulation: analysis of simulated data rather than empirical data;

Modeling: empirical test of a theoretical model;

Qualitative: use of specific techniques associated with educational evaluation (e.g., naturalistic observations, field studies).

The first author coded all the ER articles and the second author coded all the AERJ and RER articles. In 1984 the authors coded all the articles for the years 1978 to 1983. When the coding process began for this study, the two authors recoded the first year then discussed any inconsistencies in coding or changes needed in categorization. The

first six years were recoded as a reliability check before the final four years were scrutinized.

Results

The frequency of research methods or statistical techniques used in AERJ for the ten years from 1978 to 1987, the total number of articles reviewed by year, and the total frequency accumulated for each method across all ten years are shown in Table 1. The most frequent methods

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Insert Table 1 about here

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used in rank order were ANOVA/ANCOVA, multiple correlation/regression, multivariate, bivariate correlation, nonparametric, and t-test.

Table 2 presents the frequency of research methods or statistical

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Insert Table 2 about here

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techniques used in ER from 1978 to 1987, the total number of articles reviewed by year, the number of issues published by year, and the total frequency accumulated for each method across the ten-year period. The most frequent method used was descriptive. The total frequency for each of the other methods was less than 13 for the ten-year period.

In Table 3 are the frequency of research methods or statistical

Insert Table 3 about here

techniques used in RER from 1978 to 1987, the total number of articles reviewed by year, and the total frequency accumulated for each method for ten years. The frequencies tabulated for 1987 include only the first three issues because issue 4 had not been published when this study was conducted. The most frequent method coded was meta analysis.

The frequency of research methods or statistical techniques used in the three journals combined for the ten years from 1978 to 1987, the total number of articles reviewed in the three journals by year, and the total frequency accumulated for each method across all ten years for the three journals are shown in Table 4. The most frequent

Insert Table 4 about here

methods used in rank order were ANOVA/ANCOVA, descriptive, multiple correlation/regression, bivariate correlation, multivariate, nonparametric, and t-test.

Discussion and Conclusions

The results of this study are similar to those reported by Goodwin and Goodwin (1985a) for JEP from 1979 to 1983 in which the most frequent methods used in rank order were ANOVA/ANCOVA, bivariate correlation, t-test, multiple regression, multivariate, and nonparametric techniques.

Our results are also comparable to the findings of Goodwin and Goodwin (1985b) for AERJ from 1979 to 1983 in which the most frequent methods reported in rank order were ANOVA/ANCOVA, multiple regression, bivariate correlation, descriptive, multivariate, nonparametric, and t-test.

How does current pedagogy in educational research methods and statistics compare with the techniques cited in this study and the Goodwin and Goodwin studies (1985a, 1985b)? Considering the findings in this study for the three journals combined, five of the seven most frequently utilized methods (ANOVA/ANCOVA, descriptive, multiple correlation/regression, bivariate correlation, and t-test) are taught in most two-course statistics sequences required for doctoral study in a college of education. Only multivariate and nonparametric techniques are not covered comprehensively in the two-course statistics sequence. All seven of the methods are discussed in popular research methods textbooks.

It appears that graduate students trained in doctoral programs in colleges of education requiring a research methods course and the traditional two-course statistics sequence as the quantitative tool are well prepared to read and conduct research studies reported in journals published by the American Educational Research Association.

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Table 1

Methods Used in American Educational Research Journal

Method	Year 78	79	80	81	82	83	84	85	86	87	Total
Descriptive	1	1	2	3	2	4	4	3	3	5	28
Bivariate correlation	10	3	3	0	2	4	4	10	7	4	47
t-test	5	4	5	2	2	2	5	5	8	4	42
Nonparametric	6	2	3	1	3	4	7	6	11	3	46
Meta analysis	0	1	2	1	5	1	3	0	0	0	13
ANOVA/ANCOVA	15	7	10	8	11	13	22	18	20	13	137
Psychometric theory	1	2	1	1	1	2	2	1	1	0	12
Multiple correlation/regression	9	4	8	14	10	8	12	10	13	7	95
Multivariate	6	4	6	2	7	4	6	7	8	3	53
Factor/cluster	4	2	3	4	2	4	1	5	4	1	30
LISREL	5	7	0	3	2	2	6	5	6	2	38
Bayesian	0	0	0	1	0	0	0	0	0	0	1
Simulation	0	0	1	1	0	1	0	0	0	0	3
Modeling	0	1	0	0	0	0	0	1	1	1	4
Qualitative	0	0	0	0	0	0	0	0	3	1	4
Total articles reviewed	43	31	34	36	41	46	33	39	45	32	

Table 2

Methods Used in Educational Researcher

Method	Year										Total
	78	79	80	81	82	83	84	85	86	87	
Descriptive	7	8	12	4	8	6	7	8	11	13	84
Bivariate correlation	0	0	1	1	1	1	2	2	0	3	11
t-test	0	1	0	0	0	0	0	0	1	0	2
Nonparametric	0	1	2	0	0	0	0	1	0	1	5
Meta analysis	1	0	1	0	0	0	1	0	0	1	4
ANOVA/ANCOVA	0	0	3	0	0	0	0	1	2	0	6
Psychometric theory	0	0	0	0	2	1	0	2	0	0	5
Multiple correlation/regression	1	1	2	1	0	2	2	1	1	2	13
Multivariate	0	0	1	0	0	0	0	0	0	0	1
Factor/cluster	0	0	1	3	0	0	0	2	0	0	6
LISREL	0	0	0	0	0	0	0	0	1	0	1
Bayesian	0	0	0	0	0	0	0	0	0	0	0
Simulation	0	0	0	0	0	0	0	0	0	0	0
Modeling	0	0	0	0	0	0	0	0	0	0	0
Qualitative	0	0	0	0	0	0	0	0	0	0	0
Total articles reviewed	30	33	44	34	36	34	31	33	35	37	
Number of issues published	11	11	11	10	10	10	10	10	10	9	

Table 3

Methods Used in Review of Educational Research

Method	Year 78	79	80	81	82	83	84	85	86	87[a]	Total
Descriptive	0	0	2	0	0	0	2	0	1	0	5
Bivariate correlation	0	0	1	0	0	1	0	0	0	0	2
t-test	0	0	0	0	0	0	0	0	0	0	0
Nonparametric	0	0	0	1	0	0	0	0	0	0	1
Meta analysis	0	0	1	2	3	6	2	2	3	2	21
ANOVA/ANCOVA	0	0	0	0	0	0	0	0	0	0	0
Psychometric theory	0	0	1	1	0	0	0	0	0	0	2
Multiple correlation/regression	0	0	0	0	0	0	0	0	0	0	0
Multivariate	0	0	0	0	0	0	0	0	0	0	0
Factor/cluster	0	0	0	0	0	0	0	0	0	0	0
LISREL	0	0	0	0	0	0	0	0	0	0	0
Bayesian	0	0	0	0	0	0	0	0	0	0	0
Simulation	0	0	0	0	0	0	0	0	0	0	0
Modeling	0	0	0	0	0	0	0	0	0	0	0
Qualitative	0	0	0	0	0	0	0	0	0	2	2
Total articles reviewed	25	26	24	19	20	22	25	20	19	17	

[a]Includes only issues 1 to 3; issue 4 was unavailable when table was compiled.

Table 4

Methods Used in the Three Journals Combined

Method	Year										Total
	78	79	80	81	82	83	84	85	86	87	
Descriptive	8	9	16	7	10	10	13	11	15	18	117
Bivariate correlation	10	3	5	1	3	6	6	12	7	7	60
t-test	5	5	5	2	2	2	5	5	9	4	44
Nonparametric	6	3	5	2	3	4	7	7	11	4	52
Meta analysis	1	1	4	3	8	7	6	2	3	3	38
ANOVA/ANCOVA	15	7	13	8	11	13	22	19	22	13	143
Psychometric theory	1	2	2	2	3	3	2	3	1	0	19
Multiple correlation/regression	10	5	10	15	10	10	14	11	14	9	108
Multivariate	6	4	7	2	7	4	6	7	8	3	54
Factor/cluster	4	2	4	7	2	4	1	7	4	1	36
LISREL	5	7	0	3	2	2	6	5	7	2	39
Bayesian	0	0	0	1	0	0	0	0	0	0	1
Simulation	0	0	1	1	0	1	0	0	0	0	3
Modeling	0	1	0	0	0	0	0	1	1	1	4
Qualitative	0	0	0	0	0	0	0	0	3	3	6
Total articles reviewed	98	90	102	89	97	102	109	92	99	86	